

U.S.S.N. 10/040,104

BEST AVAILABLE COPYREMARKS

Thorough examination and careful review of the application by the Examiner is noted and appreciated.

Claims 1-2 and 4-20 are pending in the application. Claims 1-2 and 4-20 stand rejected.

Claim Rejections Under 35 USC §103

Claims 1, 4-7 and 14-19 are rejected under 35 USC §103(a) as being unpatentable over Park et al (Pat. Publ. '088) in view of Hajdukiewicz et al '151. It is contended that Park et al discloses substantially the present invention except that Park et al's wafer pick up system does not show the strain sensor is sensitive to at least 1 micrometer displacement, and such is disclosed by Hajdukiewicz et al. The Examiner contended that Hajdukiewicz et al shows a strain gauge or sensor having a high sensitivity for measuring the movement of from -0.5 microns to 2 microns.

The rejections of claims 1, 4-7 and 14-19 under 35 USC §103(a) based on Park et al and Hajdukiewicz et al is respectfully traversed.

U.S.S.N. 10/040,104

While the Applicants agree with the Examiner that Park et al does not show the strain sensor is sensitive to at least 1 micrometer displacement, the Applicants respectfully submit that such is neither shown by Hajdukiewicz et al.

Contrary to the Examiner's contention that Hajdukiewicz et al "shows a strain gauge or sensor having a high sensitivity for measuring the movement of from -0.5 microns to 2 microns" (col. 4, lines 10-24), Hajdukiewicz et al discloses at col. 4, lines 15-17 the following:

"... it was possible to achieve a trigger signal from the stylus after a **movement of 2 microns, plus or minus 0.5 microns**, in any direction of application of force ..."

Hajdukiewicz et al therefore teaches a sensor that is capable of detecting a movement between 1.5 microns and 2.5 microns. Hajdukiewicz et al does not teach a sensor that is capable of detecting to a sensitivity of at least 1 micron displacement, as presently claimed in independent claims 1 and 14.

U.S.S.N. 10/040,104

Moreover, Hajdukiewicz et al discloses a probe for measuring work pieces that has a body for attachment to a machine and a work piece contacting stylus carried by a stylus holder mounted within the body. Hajdukiewicz et al does not teach a semiconductor fabrication equipment and therefore, is in a completely different art than that of Park et al. As such, there cannot be any motivation to combine the two references in arriving at the present invention wafer blade equipped with strain sensors capable of measuring to a sensitivity of at least 1 micron displacement.

In the Response to Arguments section of the 10/20/2004 Office Action, the Examiner further calculated the horizontal and vertical components of the strain measuring capability of Hajdukiewicz et al and concluded that, in the x-direction, the Hajdukiewicz et al device can be used to measure down to 0.6 micron. While the Applicants congratulate the Examiner for such detailed analysis of the Hajdukiewicz et al reference, the Applicants must respectfully submit that such detailed analysis of the prior art constitutes undue experimentation of what is being taught by Hajdukiewicz et al and cannot be properly used in a §103 rejection. Throughout the Hajdukiewicz et al document, there is no teaching whatsoever that their device can be used to detect 0.6

U.S.S.N. 10/040,104

micron displacement, let alone any method of dividing the measured strain into x component and y component such that even smaller strain values can be detected.

To further illustrate that such is not taught or disclosed by Hajdukiewicz et al for measuring a strain down to 0.6 micron, Hajdukiewicz et al teaches that their device can be used to measure down to 1.5 micron "in any direction of application of force to the end of any one of the styli 22, regardless of whether the stylus involved was positioned horizontally or vertically, . . ." (Col. 4, lines 17-20). Hajdukiewicz et al therefore never taught, nor disclosed the necessity of the division of x and y components of the strain measurement.

The rejection of claims 1, 4-7 and 14-19 under 35 USC §103(a) based on Park et al and Hajdukiewicz et al is respectfully traversed. A reconsideration for allowance of these claims is respectfully requested of the Examiner.

Claims 1-2 and 4-20 are rejected under 35 USC §103(a) as being unpatentable over Park et al in view of Westervelt et al '507. It is contended that while Park et al's wafer pick-up system does not show the thickness of the strain sensor is 1 micrometer,

U.S.S.N. 10/040,104

such is shown by Westervelt et al in a semiconductor piezoelectric strain device to achieve the levels of sensitivity beyond the prior art and to provide a strain sensitivity of 2×10^{-9} .

The rejections of claims 1-2 and 4-20 under 35 USC §103(a) based on Park et al and Westervelt et al is respectfully traversed.

While the Applicants respectfully agree with the Examiner that Park et al does not teach a strain sensor that has a sensitivity to at least 1 micron displacement, such is neither taught by Westervelt et al.

Westervelt et al discloses strain gauges that are capable of measuring strain and express in strain units, such as 2×10^{-9} . However, Westervelt et al does not teach a sensor that is capable of a sensitivity in measurement of a displacement of at least 1 micron. The strain gauges disclosed by Westervelt et al are only capable of measuring a **unit-less quantity of strain, but not in units of microns** (i.e. at least 1 micron) displacement. The Applicants respectfully submit that neither Park et al nor Westervelt et al, either singularly or in combination thereof, discloses the present invention wafer blade that is equipped with

U.S.S.N. 10/040,104

a strain sensor capable of a sensitivity to at least 1 micron displacement.

The Applicants further submit that independent claim 8 recites a piezoelectric sensor mounted on the bottom surface of a wafer blade, which is not taught or disclosed by Park et al nor Westervelt et al, either singularly or in combination thereof.

A reconsideration for a separate allowance of claims 8-13 is respectfully requested of the Examiner.

In the Response to Arguments section of the 10/20/2004 Office Action, the Examiner further attempted to illustrate that Westervelt et al teaches not only unit-less strain measurement, but also teaches "advantageous applications wherever displacements are required to sense or measure". The Applicants fail to detect any teaching whatsoever of what is being taught by the present invention of a strain sensor that is sensitive to at least 1 micron displacement. There are no numerical limits taught by Westervelt et al either in the context of a strain measurement or displacement measurement.

U.S.S.N. 10/040,104

The rejection of claims 1-2 and 4-20 under 35 USC §103(a) based on Park et al and Westervelt et al is respectfully traversed. A reconsideration for allowance of these claims is respectfully requested of the Examiner.

Based on the foregoing, the Applicants respectfully submit that all pending claims, i.e., claims 1-2 and 4-20, are now in condition for allowance. Such favorable action by the Examiner at an early date is respectfully solicited.

In the event that the present invention is not in a condition for allowance for any other reasons, the Examiner is respectfully invited to call the Applicants' representative at his Bloomfield Hills, Michigan office at (248) 540-4040 such that necessary action may be taken to place the application in a condition for allowance.

Respectfully submitted,

Randy W. Tung (31,311)

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- BLACK BORDERS**
- IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- FADED TEXT OR DRAWING**
- BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- SKEWED/SLANTED IMAGES**
- COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- GRAY SCALE DOCUMENTS**
- LINES OR MARKS ON ORIGINAL DOCUMENT**
- REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- OTHER:** _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.